

A new Japanese species of *Psylla* feeding on *Elaeagnus montana*
(Homoptera : Psyllidae)*

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マメグミに寄生するキジラミの一新種
(半翅目：キジラミ科)

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グミ科の植物に寄生するキジラミ属 (*Psylla*) では、日本から既に4種が知られている。亜熱帯～暖温帯に分布するイナズマキジラミ (*P. fulguralis*) はツルグミ・ナワシログミ・マルバグミなど常緑のグミに、暖温帯に分布するツクシキジラミ (*P. kiushuensis*) もナワシログミ・マルバグミに、暖温帯～冷温帯に生息するグミキジラミ (*P. elaeagni*) とヒメグミキジラミ (*P. elaeagnicola*) は、アキグミ・ナツグミなど落葉性のグミに寄生する。このほど、大阪府と奈良県の境にある金剛山の頂上近くのブナ林で得られた、この種群の新種マメグミキジラミ (新称, *P. kongoensis*) は、マメグミに寄生し、冷温帯のみに生息するものと思われ、このグループでは、最も高標高の生息種となる。前翅が一様に黒褐色で、一見、イナズマキジラミに似ており、長い触角や前翅の脈相は類似するが、頭部、前・後翅、交尾器などの形態的な特徴から、グミキジラミに最も近縁であると思われる。

Four species of the genus *Psylla* GEOFFROY are so far known from Japan as the inhabitants of the silverberries, *Elaeagnus* spp. *P. fulguralis* KUWAYAMA, 1908 occurs from the subtropical to the warm temperate regions and is feeding on the evergreen silverberries, *E. glabra*, *E. pungens* and *E. macrophylla*. *P. kiushuensis* KUWAYAMA, 1908 occurs in the warm temperate region and is also feeding on the evergreen silverberries, *E. pungens* and *E. macrophylla*. *P. elaeagni* KUWAYAMA, 1908 and *P. elaeagnicola* Y. MIYATAKE, 1963 occur from the warm temperate to the cool temperate regions and are feeding on the deciduous silverberries, *E. umbellata* and *E. multiflora*.

The related new species has been found recently on *E. montana* from the *Fagus* forest of Mt. Kongô situated at the border of Osaka and Nara Prefectures. It is described in the present paper. It looks like *fulguralis* at a glance, basing on the opaque forewing (Fig. 1), a long antenna and some venational characters, but it is most possible that it is more closely related to *elaegni* according to the morphological characters of head, forewing, hind wing, and genitalia.

Its habitat range seems to be restricted to the cool temperate zone. Therefore, they might be possibly univoltine although their life cycle has not yet been clarified. Nymphs are freely

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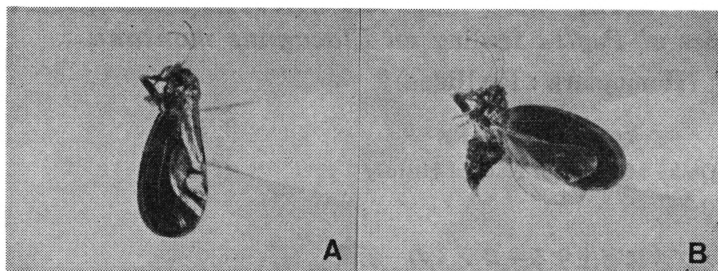


Fig. 1. Adults of *Psylla kongoensis* sp. nov. (A, ♂; B, ♀).

living on the shoots, leaves, flowers and young stem, and occasionally living together with nymphs of the different psyllid, *Epitrioza marginata* Y. MIYATAKE, 1978 on underside of a leaf on the same host tree.

***Psylla kongoensis* sp. nov.**

[Japanese name : Mame-gumi-kijirami]

Color : General color light to dark brown, with lighter stripes and markings dorsally and laterally. Antenna light brown, with two apical segments and apices of the 3rd to the 8th segments dark brown generally. Genal cones light to grayish brown, usually darker apically. Forewing opaque (Fig. 2-A), scarcely with semitransparent portion between veins, with dark brownish veins with lighter portion partly, with somewhat darker markings along posterior margin in medial cell, in cubital cell, between apices of M_{3+4} and Cu_1 , and near apex of clavus. Hind wing semiopaque (Fig. 2-B) and semitransparent. Legs light brown, with all femora dark brown, meracanthi yellowish to light brown. Abdomen dark brown to black. Male genitalia dark brown, with forceps light to reddish brown. Female genitalia dark brown in the basal half and reddish brown in the apical half.

Structure : Head (Fig. 2-C) considerably large, nearly as wide as thorax or slightly narrower, slightly deflexed. Vertex somewhat pentagonal, nearly half as long as wide, surface with sparse short pubescence. Genal cones broad, nearly as long as vertex, divergent, blunt or somewhat truncate apically, with long and dense pubescence. Antenna long and slender, nearly two times as long as width of head, with a pair of apical setae, relative length of antennal segments as follows, 4 : 3 : 14 : 9 : 9 : 9 : 9 : 7 : 4 : 3.

Thorax well arched, not hairy ; pronotum deflexed, slightly below plane of vertex, laterally with two depressions on both sides ; praescutum half as long as wide ; mesoscutum large, well convex, 5/13 as long as wide. Forewing (Fig. 2-A) large, narrow basally, broad apically, widely rounded apically, 2.1–2.4 times as long as wide, anterior margin pubescent ; pterostigma moderately large and conspicuous ; Rs sinuate, distinctly upturned apically ; M well arched ; cubital cell rather small, lower than wide. Hind wing (Fig. 2-B) rather slender, slightly broadened medially, R ended near apex, $M+Cu$ shorter than Cu, $S+Sc$ with 5–6 hooked

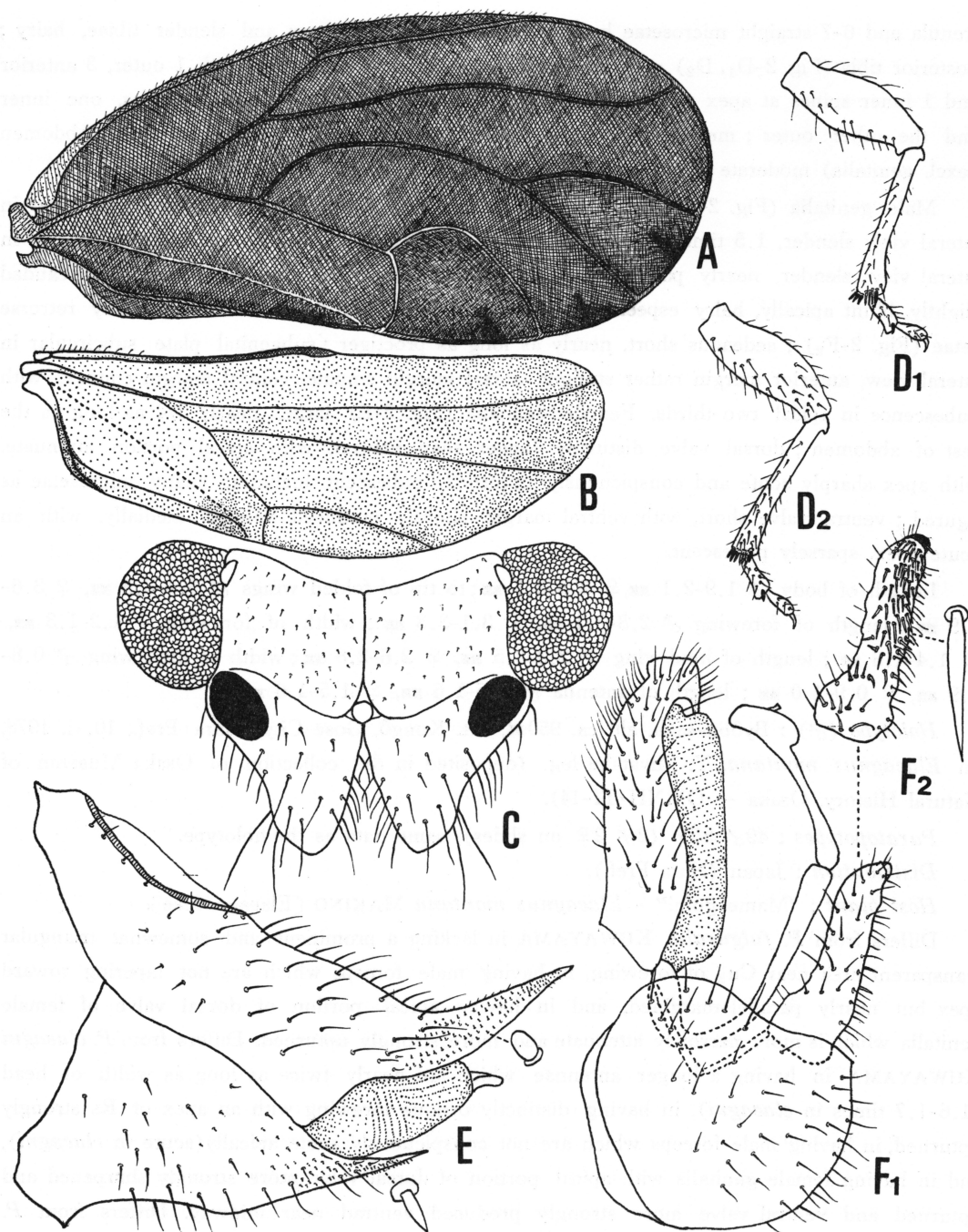


Fig. 2. *Psylla kongoensis* sp. nov. A, Forewing, ♀; B, Hind wing, ♀; C, Head, frontal view, ♀; D, Hind leg, ♀ (D₁, outer side; D₂, inner side); E, Female genitalia, lateral view; F, Male genitalia (F₁, lateral view; F₂, inner face of male forceps).

frenula and 6-7 straight microsetae basally. Legs with broad femora and slender tibiae, hairy ; posterior tibia (Fig. 2-D₁, D₂) with a small but conspicuous basal spur, with 1 outer, 3 anterior and 1 inner spines at apex ; proximal segment of metatarsus with two apical spines, one inner and the other outer ; meracanthus long, projected ventro-caudad, acute at apex. Abdomen (excl. genitalia) moderate in size, 3/4 as long as thorax, hairy only ventrally.

Male genitalia (Fig. 2-F₁) small, nearly 1/3 as long as the rest of abdomen ; proctiger in lateral view slender, 1.5 times as long as forceps, bent caudad apically, pubescent ; forceps in lateral view slender, nearly parallel-margined, slightly wider basally, with apex bent caudad slightly, blunt apically, hairy especially posteriorly, with inner surface bearing many retrorse setae (Fig. 2-F₂) ; aedeagus short, nearly as long as proctiger ; subgenital plate subcircular in lateral view, anterior margin rather straight, dorsal margin sinuate, ventral margin convex, with pubescence in apical two-thirds. Female genitalia (Fig. 2-E) large, nearly 3/4 as long as the rest of abdomen ; dorsal valve distinctly longer than ventral, with apical portion attenuate, with apex sharply acute and conspicuously upturned, pubescent including many microsetae as figured ; ventral valve short, with ventral margin slightly produced ventrad medially, with an acute apex, sparsely pubescent.

Length of body ♂ 1.9-2.1 mm, ♀ 2.5-2.7 mm ; to tip of folded wings ♂ 3.4-3.5 mm, ♀ 3.6-3.9 mm ; length of forewing ♂ 2.8-3.1 mm, ♀ 3.1-3.3 mm ; width of forewing ♂ 1.2-1.3 mm, ♀ 1.4-1.6 mm ; length of hind wing ♂ 2.3-2.5 mm, ♀ 2.6-2.8 mm ; width of hind wing ♂ 0.8-0.9 mm, ♀ 0.9-1.0 mm ; length of antenna ♂ 1.5-1.6 mm, ♀ 1.5-1.6 mm.

Holotype (♂) : Byôbu-saka, alt. ca. 950m, Mt. Kongô, Gose City, Nara Pref., 10.vi. 1978, on *Elaeagnus montana*, Y. Miyatake leg. (deposited in the collection of Osaka Museum of Natural History, Osaka — OMNH·TI-14).

Paratopotypes : 49♂ 55♀ (2♂ 2♀ on slides), same data as the holotype.

Distribution : Japan (Nara Pref.).

Host plant : "Mame-gumi" - *Elaeagnus montana* MAKINO (Elaeagnaceae).

Differs from *P. fulguralis* KUWAYAMA in lacking a prominent and somewhat triangular transparent area near Cu₂ of forewing, in having male forceps which are not tapering toward apex but nearly parallel-margined, and in having apical portion of dorsal valve of female genitalia which is more narrowly attenuate and more strongly upturned. Differs from *P. elaeagni* KUWAYAMA in having a longer antennae which are nearly twice as long as width of head (1.6-1.7 times in *elaegni*), in having distinctly opaque forewing with an apex of Rs strongly upturned, in having male forceps which are not conspicuously acute apically (acute in *elaegni*), and in having female genitalia with apical portion of dorsal valve more strongly sharpened and upturned and ventral valve more strongly produced ventrad near midway. Differs from *P. kiushuensis* KUWAYAMA in having distinctly opaque forewing with an apex of Rs strongly upturned and with a higher and narrower cubital cell, in having male forceps which are not bent caudad apically as in *elaegni*, and in having female genitalia with apical portion

of dorsal valve more strongly attenuate and upturned and ventral valve conspicuously produced ventrad midway. Differs from *elaeagnicola* Y. MIYATAKE in being distinctly larger (1.3–1.9 mm in *elaeagnicola*), in having much longer antennae which are nearly 2 times as long as width of head (1.2 times in *elaeagnicola*), in having remarkably opaque forewing with an apex of Rs strongly upturned and a higher and narrower cubital cell, in having a rather straight forceps which are not prominently bent caudad in the apical half as in *elaeagnicola*, and in having an apical portion of dorsal valve in female genitalia which is much longer and upturned strongly.





Key to the species of *Psylla* feeding on *Elaeagnus* spp. from Japan

- 1(6) Antenna distinctly shorter than twice as long as width of head. Forewing transparent.
- 2(3) Antenna short, 1.2 times as long as width of head. Dorsal valve of female genitalia rather weakly upturned apically. Small species, ♂ 1.3–1.5 mm, ♀ 1.6–1.9 mm..... *elaeagnicola* Y. MIYATAKE
- 3(2) Antenna moderately long, 1.6 to 1.8 times as long as width of head. Dorsal valve of female genitalia strongly and sharply upturned apically. Medium size, ♂ 1.7–2.1 mm, ♀ 2.0–2.5 mm.
- 4(5) Forewing with 4 additional, black or brown markings or maculae besides one at apex of clavus along posterior margin, in cubital cell, in medial cell, between M_{3+4} and Cu_1 , and between Rs and M_{1+2} . Hind wing rather conspicuously brown along posterior margin. Genal cones distinctly shorter than vertex, rather broad *elaeagni* KUWAYAMA
- 5(4) Forewing without any markings along posterior margin except for one at apex of clavus. Hind wing not brown along posterior margin. Genal cones nearly as long as vertex, slender, divergent *kiushuensis* KUWAYAMA
- 6(1) Antenna nearly twice as long as width of head. Forewing opaque, not transparent.
- 7(8) Forewing with a prominent and somewhat triangular transparent area near Cu_2 ; apex of Rs moderately upturned *fulguralis* KUWAYAMA
- 8(7) Forewing without a transparent area near Cu_2 ; apex of Rs strongly upturned *kongoensis* sp. nov.

Discussion

As shown in Table 1 five species of *Psylla* feeding on the silverberries, *Elaeagnus* spp. have more or less different ecological aspects in the food habit, the range of distribution and the habitat zone. However, their morphological characters of head, wing venation, male genitalia and especially those of female genitalia of which dorsal valve are characteristically attenuate and strongly upturned apically are quite resembling. According to those similarities of the host relationships and the basamental morphological characters, it is most possible that they are

Table 1. Some ecological aspects of the species of *Psylla* feeding on *Elaeagnus* spp. in Japan.

Species of psyllids	Host plants	Food habit	Range of distribution	Habitat zone
<i>Psylla kongoensis</i>	— <i>Elaeagnus montana</i>	monophagy	limited	cool temperate only
<i>P. elaeagnicola</i>	 <i>E. umbellata</i>	oligophagy	scattering	warm to cool temperate
<i>P. elaeagni</i>	 <i>E. multiflora</i>	oligophagy	wide	warm to cool temperate
<i>P. kiushuensis</i>	 <i>E. pungens</i>	oligophagy	moderately wide	warm temperate
<i>P. fulguralis</i>	 <i>E. glabra</i> <i>E. macrophylla</i>	polyphagy	wide	subtropical to warm temperate

congeneric or the monophyletic group, and they are the sister species each other. Their speciation might have occurred resulting from the host selection originally in the different habitat zones. The host change from or to the evergreen species to or from the deciduous species and the change of the habitat zones, from or to subtropical to or from warm temperate zone, or from or to warm temperate to or from cool temperate zone, may have also taken place or aided in the course of their speciation.

The present new species, *kongoensis* is at a glance similar in coloration and in structures of antenna and wing venation to *fulguralis*, but is most closely related to *elaegni* in structures of both male and female genitalia in addition to those of head and venation of both wings. Therefore, *kongoensis* seems to have derived from *elaegni* which is widely distributed in the warm temperate to the cool temperate zones. As there are complicated problems concerning with seasonal and geographical variations among the species involved, the systematic analysis of this species group will be tried in future from the total aspects, perhaps including with the species of *Epitrioza* of the different subfamily, Triozinae which also feed on the silverberries, *Elaeagnus* spp., however.

References

- KUWAYAMA, SHIGERU. 1908. Die Psylliden Japans I. *Trans. Sapporo Nat. Hist. Soc.* 2 : 149-190, Tafel 3, 20 Figs.
 MIYATAKE, Y. 1963. A revision of the subfamily Psyllinae from Japan (Hemiptera : Psyllidae) I. *J. Fac. Agr., Kyushu Univ.* 12(4) : 323-357, 12 figs.
 ———. 1964. Ditto, II. *Ibid.*, 13(1) : 1-37, 10 figs.